

Prepackaged Mounting Assembly

This application is a Continuation-In-Part of U.S. Patent Application Serial No. 10/790,973 entitled "Prepackaged Mounting Assembly", filed March 2, 2004, which is a
5 Continuation-In-Part of U.S. Patent Application Serial No. 10/723,122 entitled "Fan
Rated Junction Box Assembly", filed November 26, 2003, which is a Continuation-In-
Part of U.S. Patent Application Serial No. 10/464,334 entitled Prepackaged Mounting
Assembly and Bracket Combination, filed June 18, 2003, which is a Continuation-In-Part
of 10/361,292 entitled "Prepackaged Mounting Assembly with Holstered Screws", filed
10 February 10, 2003 now U.S. Patent 6,632,998, which is a Continuation-In-Part of U.S.
Patent Application Serial No. 10/287,088 entitled "Prepackaged Mounting Assembly",
filed November 4, 2002 now U.S. Patent 6,646,201, which is a Continuation-In-Part of
U.S. Patent Application Serial No. 10/012,584 entitled "Prepackaged Mounting
Assembly", filed November 7, 2001, now U.S. Patent 6,509,524, and is a Continuation-
15 In-Part of U.S. Patent Application Serial No. 10/017,571 entitled "Electrical Fixture
Mounting Box and Mounting Assembly", filed October 22, 2001, now U.S. Patent
6,677,523, which is a Continuation-In-Part of U.S. Patent Application Serial No.
09/784,981 entitled "Electrical Fixture Mounting Box and Mounting Assembly", filed
February 16, 2001, now U.S. Patent 6,355,883, and is a Continuation-In-Part of U.S.
20 Patent Application Serial No. 09/373,431 entitled "Electrical Fixture Mounting Box",
filed August 13, 1999, now U.S. Patent 6,191,362, of which all of the above are
incorporated by reference herein in their entireties.

Field of the Invention

The present invention relates to mounting assemblies for electrical devices, and more particularly to an L-shaped mounting assembly for securing a device, such as a ceiling fan, light fixture, or similar device to an overhead beam.

Background of the Invention

The present invention expands upon the concept of the prepackaged mounting assembly that is disclosed in and shares inventorship with U.S. Patents 6,509,524, 6,632,998, 6,646,201, and 6,677,523 and U.S. Application Serial No. 10/790,973. The prepackaged mounting assemblies disclosed in these patents provide all the hardware needed for attaching a mounting assembly to an overhead beam, including all required fasteners to complete the installation, without the need for an outer wrap or separate packaging to hold the separate components.

In particular, U.S. Patent 6,646,201 provided an L-shaped mounting assembly that provided a large integral internal wiring cavity and also disclosed the use of an initial fastener for use in initially securing the mounting assembly to an overhead beam. By securing with the initial fastener, the installer's hands are advantageously freed to complete the remaining installation steps. Load bearing fasteners, which were held in temporary storage receptacles for shipment and storage, were then removed and driven into permanent receptacles and into the supporting beam to securely attach the L-shaped assembly thereto.

U.S. Patent 6,646,201 included an alternate embodiment of the L-shaped mounting assembly, which was preferred when there was no provision in the mounting assembly for apertures for receipt of the load bearing fasteners or when the manufacturer's bracket included apertures extending beyond the side walls of the mounting assembly. This mounting assembly is installed initially with an initial mounting screw. The load bearing fasteners are then removed from their temporary storage receptacles and installed through the manufacturer's bracket and directly into the overhead beam to secure the assembly thereto. The load bearing fasteners are thereby installed outboard of the side walls of the lower junction box of the L-shaped mounting assembly and extend directly into the overhead beam. By moving the installation point of the load bearing fasteners outboard the side walls of the lower junction box, the alternate embodiment of the L-shaped mounting assembly could be used with virtually any oversized bracket provided separately by manufacturer's, including those for light fixtures, ceiling fans, or similar overhead electrical devices.

Although the alternate embodiment disclosed in U.S. Patent 6,646,201 provided enabled the L-shaped mounting assembly to accommodate an oversize manufacturer's bracket, it was difficult to align the bracket with the mounting assembly and the beam to which it was attached.

To solve the problem of aligning the manufacturer's bracket with the mounting assembly, U.S. Application No. 10/790,973 disclosed an L-shaped mounting assembly that provided an arrangement for aligning a manufacturer's bracket with the mounting assembly for proper installation of load bearing fasteners into the supporting beam. The aligning arrangement included posts extending downwards from a flange on the lower

end of the mounting assembly. The manufacturer's bracket, which typically includes longitudinal slots, was simply placed against the flange with the posts extending through the slots.

Although the mounting assembly of U.S. Application No. 10/790,973 provided a
5 means of aligning the bracket with the mounting assembly and the beam, as a result of its oversized junction box, it was especially useful for mounting an electrical device to an unfinished ceiling, in which the beams are bare and exposed or in which the sheet rock has not yet been installed. If the mounting assembly of S/N 10/790,973 were used in a retrofit situation, in which the sheet rock were already installed, it was not easy to form a
10 hole for accepting the mounting assembly without disturbing the surrounding ceiling surface and thereby requiring the installer to repair the surrounding ceiling area.

What is needed therefore is an L-shaped mounting assembly that can be used in a retrofit situation or a situation in which the ceiling has already been finished. The mounting assembly should be capable of being easily installed in a finished ceiling, with
15 minimal disturbance to the surrounding ceiling surface. An adequately sized cavity should be provided for holding wiring connections. The mounting assembly should furthermore have the advantage of providing a mounting structure that is capable of being stored, shipped, and sold as a prepackaged unit with all required fasteners for installation self-contained within the unit. Fasteners should be held securely enough to permit
20 storage, shipping, display and handling without the need for an outer wrap or separate packaging to retain the fasteners with the assembly.

Summary of the Invention

According to the present invention, there is provided a mounting assembly for securing a device, such as a ceiling fan, light fixture, or similar device to an overhead beam. The mounting assembly includes an L-shaped mounting box that includes a first
5 and a second junction box. Each junction box includes an integral arcuate flange portion that cooperate to accept a separately supplied bracket thereon. The bracket includes slots therein and the integral flange portion includes downward extending alignment posts to enable easy centering of the bracket under the mounting box and the overhead beam. All hardware required to complete installation of the device is temporarily secured to the L-
10 shaped box for shipment and storage, including an initial fastener and load bearing fasteners. The L-shaped mounting assembly is especially useful for mounting an electrical device to an existing ceiling.

At the installation site, a circular hole is made in the sheetrock to expose the overhead beam. The initial fastener, held temporarily in the top of the second junction
15 box, is driven into the overhead beam to hold the mounting assembly to the beam. Wiring connections are then completed in the wiring cavity. The bracket is then easily centered with the mounting box by slipping the bracket onto the alignment posts with the posts extending through the slots of the bracket. The load bearing fasteners are removed from their temporary storage holsters within the first junction box and installed through the
20 bracket exterior of the side walls of the first junction box and into the overhead beam to secure the bracket thereto.

Description of the Drawings

Fig. 1 is a perspective view of the L-shaped mounting assembly of the present invention.

Fig. 2 is a bottom view of the mounting assembly of Fig. 1.

Fig. 3 is a conceptual sectional view of the mounting assembly taken along line 3-3 of Fig. 2 and omitting the mounting box walls to show the relative positions of the initial fastener and load bearing fasteners in the mounting assembly.

Fig. 4 is a side view of the mounting assembly of Fig. 1.

Fig. 5 is a sectional view of the mounting assembly taken along line 5-5 of Fig. 2.

Fig. 6 is a sectional view of a holster taken along line 6-6 of Fig. 2 and depicting a load bearing fastener secured temporarily therein.

Fig. 7 is a boss detail including an initial mounting fastener.

Fig. 8 is a perspective view of the mounting assembly of Fig. 1 after it has been initially mounted on a support beam by the initial mounting fastener and with the load bearing fasteners seated in their holsters.

Fig. 9 is a perspective view of the mounting assembly of Fig. 1 after being secured to a support beam by load bearing fasteners driven through the separately supplied bracket.

Fig. 10 is a perspective view of the mounting assembly of Fig. 1 after being secured to a support beam in a retrofit situation, wherein a circular portion of the sheet rock has been removed to expose the overhead beam.

Table of Nomenclature

The following is a listing of part numbers used in the drawings along with a brief description:

	<u>Part Number</u>	<u>Description</u>
5	20	prepackaged mounting assembly
	22	first junction box
	24	second junction box
	26	arcuate side wall of first junction box
	27	flat side wall of first junction box
10	28	top of second junction box
	32	opposing sides of second junction box
	34	distal end
	36	lower surface of top
	38	side walls of second junction box
15	40	first arcuate flange
	40A	circular flange portion
	42	lower edge of first arcuate flange
	46	second arcuate flange
	46A	circular flange portion
20	48	lower edge of second arcuate flange
	50	alignment post
	52	holster
	54	tubular projection
	56	inner surface
25	58	load bearing fastener
	60	initial fastener
	62	removable wall sections or knockouts
	64	top of first junction box
	66	fitting
30	68	boss
	70	interior volume
	72	shallow cavity
	74	deep cavity
	76	wide bore
35	78	mouth
	80	narrow bore
	82	plane
	84	point
	86	top surface
40	96	beam
	98	bracket
	100	longitudinal slots

	102	seat
	103	threaded bore
	104	center of mounting assembly
	106	circular outer periphery
5	108	sheet rock

Detailed Description

The present invention is a prepackaged mounting assembly for mounting a suspended electrical fixture from an overhead beam and is especially adapted for a retrofit application, in which the ceiling is finished.

With reference to Fig. 1, a preferred embodiment is shown of the prepackaged mounting assembly 20 which includes a first 22 and a second 24 junction box integrally formed in one piece. The first junction box 22 has deep side walls including an arcuate side wall 26 and a flat side wall 27. The second junction box 24 includes a top 28 that is integral with and extends orthogonally from the flat side wall 27 of the first junction box 22.

Referring to Figs. 1 and 2, the top 28 of the second junction box 24 includes two opposing sides 32, a distal end 34, and a lower surface 36. Integral side walls 38 extend downward from the lower surface 36 of the top 28 along the distal end 34 and along the opposing sides 32 of the second junction box 24. The side walls 38 of the second junction box 24 at the distal end 34 form a first arcuate flange 40 having a lower edge 42 ending in a common plane with the side walls 38 of the opposing sides 32. A second arcuate flange 46 projects from the first junction box 22 and a portion of the top 28 of the second junction box 24 and includes a lower edge 48. The lower edge 42 of the first arcuate flange 40 is coplanar with the lower edge 48 of the second arcuate flange 46. Two

alignment posts 50 extend downward from the side walls 38 of the second junction box 24 at each of the opposing sides 32.

With reference to Fig. 3, the prepackaged mounting assembly 20 includes two holsters 52 consisting of tubular projections 54 integral with the inner surface 56 of the flat side wall 27 of the first junction box 22. Each holster 52 includes a load bearing fastener 58 frictionally engaged therein for temporary storage with said prepackaged mounting assembly 20 prior to installation. The prepackaged mounting assembly also includes an initial fastener 60 frictionally engaged in the top 28 of the second junction box 24.

As shown in Fig. 2, one or more removable wall sections 62 or knockouts may be included in either the arcuate side wall 26 or top 64 of the first junction box 22 or in the top 28 of the second junction box 24. A snap in fitting such as the Black Button™ available from Arlington Industries, Inc., 1 Stauffer Industrial Place, Scranton, PA, may be inserted in one or more of the knockouts 62 such as the fitting 66 shown in the top 64 of the first junction box 22.

As shown in Fig. 2, the load bearing fasteners 58 and the initial fastener 60 are easily accessible from the bottom of the mounting assembly 20 as the tubular projections 54 which hold the load bearing fasteners 58 and the boss 68 which holds the initial fastener 60 are positioned well within the side walls 26, 27 of the first junction box 22 and the side walls 38 of the second junction box 24. The first arcuate flange 40 and second arcuate flange 46 cooperate to form opposing circular flange portions 40A and 46A. The opposing circular flange portions 40A and 46A and the side walls 38 of the second junction box 24 define an interior volume 70 therein. The interior volume 70

includes the shallow internal cavity 72 of the second junction box 24 and the deep cavity 74 of the first junction box 22.

Referring to Figs. 3 and 6, the load bearing fasteners 58 are held in their temporary storage positions in the holsters 52. The holsters 52 consist of tubular projections 54 integral with the inner walls of the first junction box 22. As shown in Fig. 6, the tubular projections 54 include a wide bore 76 at the mouth 78 and a narrow bore 80 further within. The wide bore 76 is larger than the major thread diameter of the load bearing fastener 58, the narrow bore 80 is smaller than the major thread diameter, and both bores include smooth interior walls. Threads are formed by the load bearing fastener 58 in the narrow bore 80 portion of the tubular projections 54 as the load bearing fasteners 58 are axially advanced therein. After being threaded into the holsters 52, the load bearing fasteners 58 are held securely therein for shipment and storage and are easily accessible and removable when required at installation. As shown in Fig. 3, the load bearing fasteners 58 in temporary storage in the holsters 52 do not extend beyond a plane 82 connecting the coplanar arcuate flanges 40 and 46.

The initial fastener 60 is securely held in its boss 68 for shipment and storage. As shown in Fig. 7, the boss 68 is integral with the top 28 of the second junction box and with the initial fastener 60 inserted therein for shipment and storage the point 84 of the initial fastener 60 does not extend beyond the top surface 86 of the top 28.

With reference to Fig. 4, it should be noted that the top 28 of the second junction box 24, being orthogonal to the flat side wall 27 of the first junction box 22, forms a seat 102 thereon for flush placement against an overhead beam 96.

For operation of the prepackaged mounting assembly 20, the reader is referred to Figs. 8-10. Fig. 8 depicts the prepackaged mounting assembly 20 placed against the beam 96 with the load bearing fasteners 58 held securely in the holsters 52, which is the position they are in for shipment and storage of the mounting assembly. As shown in Fig. 8, the prepackaged mounting assembly 20 is placed against the beam 96 such that the seat 102 including the flat side (not shown) and top 28 of the second junction box 24 are flush against the beam 96. The initial fastener 60 is then advanced axially into the beam 96 thereby securing the prepackaged mounting assembly 20 to the beam 96.

Fig. 9 depicts the initial fastener 60 fully advanced axially into the beam 96. It should be noted that the purpose of the initial fastener 60 is to hold the mounting assembly 20 in place thereby freeing the installer's hands. The bracket 98, which is typically supplied separately by the manufacturer with the electrical fixture, is then lifted upwards until the longitudinal slots 100 are fitted upon the alignment posts 50, as shown in Fig. 9. It should be noted that the alignment posts 50 have a width less than that of the longitudinal slots 100. Preferably the alignment posts 50 are between 0.15 and 0.20 inch in width and even more preferably 0.18 inch in width. The alignment posts 50 are preferably between 2.6 and 3.5 inches apart measured between their outer sides and most preferably are 3.11 inches apart. These critical dimensions of the alignment posts 50 permit them to accommodate a wide range of brackets commonly supplied by manufacturers with their electrical devices.

The load bearing fasteners 58 are then removed from their temporary storage positions in the holsters 52, as shown in Fig. 8, and placed outside of the side walls 38 of the second junction box 24, through the longitudinal slots 100 of the bracket 98, and

advanced axially into the overhead beam 96 as depicted in Fig. 9. to securely fasten the bracket 98 and prepackaged mounting assembly 20 to the overhead beam 96. It should be noted that the alignment posts 50 and second junction box 24 are of a size to position the load bearing fasteners 58 outside of the opposing sides 32 of the second junction box 24.

5 This insures that all of the weight of the fixture (not shown) eventually suspended from the bracket 98 is supported by the beam 96 and not by the prepackaged mounting assembly 20.

The bracket 98 is typically supplied with an arrangement for attaching the electrical device (not shown) such as a threaded bore 103, as shown in Fig. 9. After the
10 prepackaged mounting assembly 20 is secured to the beam 96 by the load bearing fasteners 58 as shown in Fig. 9, the installer can then hang a device from the threaded bore 103 and, once the weight of the electrical device is supported by the bracket 98, complete wiring connections between the supply and device.

The first 22 and second junction boxes 24 of the prepackaged mounting assembly
15 of the present invention are preferably molded in one piece from plastic. An especially preferred material of construction is polycarbonate, although they could be molded of other elastomeric materials.

As shown in Fig. 2, the first 40 and second 46 arcuate flanges are at the same radius from the center 104 of the mounting assembly 20 thereby giving the assembly a
20 circular outer periphery 106. All portions of the mounting assembly 20 are bounded laterally by the circular outer periphery 106 and no portions extend laterally beyond the circular outer periphery.

The prepackaged mounting assembly 20 therefore is especially useful in a retrofit situation, such as shown in Fig. 10, in which the ceiling, sheet rock 108 or other planar material covering the beams, is finished. To install the mounting assembly, an installer simply uses a hole saw to cut a circular hole in the ceiling 108 at the appropriate place to
5 expose an overhead rafter or beam. The prepackaged mounting assembly 20, having a circular outer periphery 106, is then lifted through the hole and the seat 102 (not shown) pressed against the beam. The initial fastener 60, bracket 98, and load bearing fasteners 58 are then installed in sequence as described previously. The side walls 38 of the second junction box are preferably 0.5 inch in depth. Therefore, with the sheet rock 108 cut away
10 and the mounting assembly 20 tightly secured to the overhead beam 96, as shown in Fig. 10, the lower end of the first 40 and second 46 arcuate flanges are substantially coplanar with the bottom surface of the surrounding sheet rock 108.

The prepackaged mounting assembly of the present invention provides flexibility by supporting a wide range of fixtures of the type that include a mounting bracket. It has
15 the advantage of providing a mounting assembly that can be easily mounted to an existing finished ceiling, in which sheet rock or other material covers the overhead rafters. The prepackaged mounting assembly further provides the advantage that all of the required hardware for mounting the electrical fixture is included with the assembly. The possibility of mistakes from using a fastener that is inadequate for supporting the
20 intended load is thereby minimized. By including all the fasteners temporarily secured in storage locations within the assembly, the prepackaged mounting assembly minimizes the chance that an installer will lose a critical fastener. By freeing the installer's hands, there is much less chance of a fastener being dropped. By locating the load bearing fasteners

inside the interior volume of the assembly for shipment and storage, the fasteners are thereby protected during shipment and storage and facilitate ease of packaging. Inclusion of the alignment posts provides an arrangement for quickly aligning a manufacturer's bracket for proper installation of load bearing fasteners into the supporting beam. The
5 prepackaged mounting assembly furthermore provides a large cavity for wiring connections. The prepackaged mounting assembly of the present invention provides the advantage of holding the cover and fasteners securely enough to permit storage, shipping, display, and handling without the need for an outer wrap or separate packaging to retain the cover and fasteners with the assembly.

10 As the invention has been described, it will be apparent to those skilled in the art that the same may be varied in many ways without departing from the spirit and scope of the invention. Any and all such modifications are intended to included within the scope of the appended claims.